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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/715,611

11/18/2003

Tzu-Ching Tsai

10113171

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03/08/2005

QUINTERO LAW OFFICE
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EXAMINER

PHAM, THANHHA S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,611

Applicant(s)

TSAI ET AL.

Examiner

Thanhha Pham

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/02/2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to Applicant's Preliminary Amendment dated 04/02/2004.

Oath/Declaration

1. Oath/Declaration filed on 11/18/2003 has been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto et al. [US 6,069,038].**

► With respect to claims 1, 4 and 11, Hashimoto et al. (figs.3-19, cols. 9-13) discloses a method of a filling bit line contact via, comprising:

providing a substrate (1, fig. 7) having a device region (memory cell region including gate electrode 8A) and periphery region (logic LSI including gate electrode 8B), the device region having a transistor with a gate electrode (8A), drain region (11), and source region (11) on the substrate (1);

forming a dielectric layer (22) overlying the substrate, the dielectric layer having a bit line contact via (24) exposing the drain region (11, fig. 13, col. 11 lines 38-46), and periphery contact via (33, fig. 17, col. 12 lines 23-32) exposing the periphery region (fig. 17, col. 12 lines 23-32);

forming a doped conductive layer (26, fig. 14) overlying the drain region (11), dielectric layer (22), and periphery region (col. 12, lines 1-7: doped polysilicon being formed on nitride 22);

removing the doped conductive layer (26) using etching, thereby remaining the doped conductive layer (26), lower than the dielectric layer (22), overlying the drain region (11) (fig. 16, col. 12 lines 20-23);

conformally forming a barrier layer (titanium nitride film) overlying the dielectric layer (22), doped conductive layer (26), and periphery region (fig. 18, col. 12 lines 58-67 and col. 13 lines 1-2); and

forming a first conductive layer (tungsten film) filling the bit line contact via and periphery contact via (fig. 18, col. 12 lines 58-67 and col. 13 lines 1-2).

- ▶ With respect to claims 2 and 12, Hashimoto et al. (fig. 11, col. 11 lines 34-37) discloses that the dielectric layer (22) is an oxide layer.
- ▶ With respect to claims 3 and 13, Hashimoto et al. (fig. 14, col. 12 lines 24) discloses that the doped conductive layer (26) is polycrystalline silicon doped with As.
- ▶ With respect to claims 5, 6, 14 and 15, Hashimoto et al. (fig. 18, col. 12 lines 58-64) discloses that the barrier layer (TiN) prevents the diffusion of the first conductive layer.

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- ▶ With respect to claims 7 and 16, Hashimoto et al. (fig. 18, col. 12 lines 60-61) discloses that the first conductive layer is tungsten.
- ▶ With respect to claims 8 and 17, Hashimoto et al. (fig. 8, col. 10 lines 47-50) discloses that the periphery region is a doped region (16).
- ▶ With respect to claims 9 and 18, Hashimoto et al. (fig. 6, col. 9 lines 34-51) discloses that the periphery region is a second conductive layer (8B), and the gate electrode (8B) further comprises the second conductive layer (8B).
- ▶ With respect to claims 10 and 19, Hashimoto et al. (fig. 6, col. 9, lines 31-51) discloses that the second conductive layer (8B) is a silicide layer comprising tungsten.

Conclusion

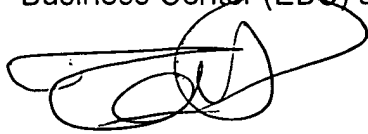
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'Thanhha Pham', written over a horizontal line.

Thanhha Pham
Patent Examiner
Patent Examining group 2800